Table 2.1: General Radiographic Unit Survey Requirements

	Test	Frequency	Measurements	Tolerance
1.	**Exposure Reproducibility**	A	10 repeat measurements	cv<0.05
		P	4 repeat measurements	if cv>0.05, do 4 more
2.	**Timer Reproducibility**	A	10 repeat measurements	cv<0.05
		P	4 repeat measurements (all at 100mSec)	cv<0.05 if>0.05, 4 more
3.	**Timer accuracy**	A	From 1 second to the minimum timer setting in increments of decreasing time of 50%.	±5% of nominal setting
		P	minimum and 1 second plus 3 others evenly spaced between	±5% of nominal setting
4.	**Linearity of mA/mAS**	A	all focal spots, all mA stations. If continuous, in 100 mA increments from min to max	change <0.1 of the sum of measurements at adjacent mA stations
		P	5 adjacent mA stations over range of clinical use	
5.	**kVp Accuracy**	A	for each generator: from 50 up to the maximum kVp setting by 5's	±5% of nominal setting
		P	for each generator: from 60 up to the maximum kVp setting by 20's	±5% of nominal setting
6.	**Beam Quality**	A/P	@ 80 kVp, 1st HVL	minimum HVL of 2.3 mm Al
7.	**Output Linearity tracking by KVP**	A	Max mAs at each kV by 10's - from 50-150	change <0.1 of sum of measurements at adjacent KVP settings. Will see differences if incoming power is inadequate
		P	60, 80, 100 kVp at constant mAs	change <0.1 of sum of measurements at adjacent KVP settings
8.	**Light Field Intensity**	A/P	Average of 4 quadrants of 25x30 cm light field	average illuminance ≥ 160 lux (15 ftcd) at 100 cm or at the max SID whichever is less

Abbreviations: A: acceptance, P: periodic, cv: Coefficient of variation, KVP: kilovolt peak, F.S.: focal spot, mA: milliamp, HVL: half value layer, MAS: millamp seconds, ftcd: foot candle, cm: centimeters, SID: source-to-image distance, PBL: positive beam limitation, AEC: automatic exposure control, OD: optical density, OD_{BL}: optical density baseline, DCF: density control function, ESE: entrance skin exposure, AP: anterior to posterior, L: lumbar, C: cervical, PA: posterior to anterior, LP: line pairs

Table 2.1: General Radiographic Unit Survey Requirements, continued

	Test	Frequency	Measurements	Tolerance
9.	**Light field/x-ray beam alignment**	A/P	Set any clinically used field size (e.g. 18 x 24 cm)	total misalignment of edges of light field vs x-ray field not to exceed 2% of SID along either length or width
9a.	**X-ray field size - indicated vs actual**	A/P	Set any clinically used field size (e.g. 18 x 24 cm)	± 2% SID
10.	**Central Beam Alignment**	A/P	Measurement of perpendicularity of central beam.	5 mm
11.	**Indicated SID**	A/P	Measuring tape vs indicated distance	± 2% SID
12.	**PBL**	A/P	With x-ray, 1 cassette size bi-directional all other sizes use light field	± 3% SID centers ± 3% SID
13a.	**Focal Spot Size** (for focal spots < 1.0 mm)	A/P	Use star pattern (Slit camera or pinhole camera may be used)	anode-cathode direction: perp: 1.5x nom parallel: 2.15 x nom
13b.	**Focal spot constancy** (alternative method for period evaluation**)**	A/P	RMI power target perp and parallel to anode-cathode axis @ 80KVP, 100mA, 8mS	Perp _LP Parallel_LP
14.	**AEC**	A/P	Table and Wall	
	a. OD		DCF = 0, 4 cm Al phantom	$OD = OD_{BL} \pm 0.15$ at center of field (OD_{BL} must be > 1.2)
	b. thickness compensation		Check each detector at 2 and 4 cm Al thicknesses	$OD = OD_{BL} \pm 0.3$
	c. kVp compensation		70, 90, 110 kVp	$OD = OD_{BL} \pm 0.3$
	d. DCF tracking		All DCF settings	should vary as expected, approx 25% between settings
	e. reproducibility		3 exposures each detector	All ≤ ± 5% of mean
	f. balance		Center to each side	$OD = OD_{BL} \pm 0.1$
	g. Back-up timer		Max exp time, Pb over all detectors	Elapsed < 600 mAs or 2000 mAs for tube potentials < 50 kV

Abbreviations: A: acceptance, P: periodic, cv: Coefficient of variation, KVP: kilovolt peak, F.S.: focal spot, mA: milliamp, HVL: half value layer, MAS: millamp seconds, ftcd: foot candle, cm: centimeters, SID: source-to-image distance, PBL: positive beam limitation, AEC: automatic exposure control, OD: optical density, OD_{BL}: optical density baseline, DCF: density control function, ESE: entrance skin exposure, AP: anterior to posterior, L: lumbar, C: cervical, PA: posterior to anterior, LP: line pairs

Table 2.1: General Radiographic Unit Survey Requirements, continued

	Test	Frequency	Measurements	Tolerance
15.	**ESE Measurement**	A/P	PA Chest (wall bucky), AP Abdomen, C spine, Lat Skull, extremity	± 20% most recent NEXT report

Abbreviations: A: acceptance, P: periodic, cv: Coefficient of variation, KVP: kilovolt peak, F.S.: focal spot, mA: milliamp, HVL: half value layer, MAS: millamp seconds, ftcd: foot candle, cm: centimeters, SID: source-to-image distance, PBL: positive beam limitation, AEC: automatic exposure control, OD: optical density, OD_{BL}: optical density baseline, DCF: density control function, ESE: entrance skin exposure, AP: anterior to posterior, L: lumbar, C: cervical, PA: posterior to anterior, LP: line pairs